

JUNG et al. - 10/728,948
Attorney Docket: 040008-0307076

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously presented) A method of manufacturing a semiconductor device, comprising:
 - forming an insulating layer on a semiconductor substrate;
 - forming a contact hole on the insulating layer;
 - depositing a WSiN layer in the contact hole and on the insulating layer using an atomic layer deposition process, wherein a single atomic layer of the WSiN layer is deposited by a continuous cycle comprising:
 - injecting SiH₄ gas,
 - purging any remaining SiH₄ gas using an inert gas,
 - injecting WF₆ gas,
 - purging the remaining WF₆ gas using an inert gas,
 - injecting NH₃ gas, and
 - purging any remaining NH₃ gas using inert gas;
 - depositing a tungsten layer on the barrier metal using the atomic layer deposition process; and
 - filling the contact hole with a tungsten.
2. (Previously presented) The method of claim 1, wherein the atomic layer deposition process for the WSiN layer and the tungsten layer is performed in a single reaction chamber.
3. (Cancelled).
4. (Original) The method of claim 1, wherein the tungsten is deposited by chemical vapor deposition.
5. (Cancelled).

JUNG et al. -- 10/728,948
Attorney Docket: 040008-0307076

6. (Previously presented) The method of claim 1, wherein the WSiN layer has a thickness of 20 to 100Å.
7. (Previously presented) The method of claim 1, wherein the SiH₄ gas is injected at a flow rate of 50~100 SCCM.
8. (Previously presented) The method of claim 1, wherein the WF₆ gas is injected at a flow rate of 10~50 SCCM.
9. (Previously presented) The method of claim 1, wherein the NH₃ gas is injected at a flow rate of 30~80 SCCM.
10. (Original) The method of claim 7, wherein the SiH₄ gas and the WF₆ gas are injected in a ratio of 1:5.
11. (Original) The method of claim 8, wherein the SiH₄ gas and the WF₆ gas are injected in a ratio of 1:5.
12. (Original) The method of claim 2, wherein the tungsten layer is deposited at a temperature of 200 to 600°C.
13. (Original) The method of claim 1, wherein a single atomic layer of the tungsten layer is deposited by a continuous cycle comprising:
 - injecting SiH₄ gas;
 - purging any remaining SiH₄ gas using an inert gas;
 - injecting WF₆ gas; and
 - purging any remaining WF₆ gas using an inert gas.
14. (Original) The method of claim 13, wherein the tungsten layer is deposited to a thickness of 20 to 100Å.
15. (Original) The method of claim 5, wherein the inert gas is any one of Ar gas and a mixture of Ar gas and H₂ gas.

JUNG et al. -- 10/728,948
Attorney Docket: 040008-0307076

16. (Original) The method of claim 13, wherein the inert gas is any one of Ar gas and a mixture of Ar gas and H₂ gas.

17-20. (Canceled)